AIR NEW ZEALAND

25 March 2021

Climate Change Commission
Level 21, 1 Willis Street
WELLINGTON 6011

AIR NEW ZEALAND SUBMISSION ON THE CLIMATE CHANGE COMMISSION'S 2021 DRAFT ADVICE FOR CONSULTATION

1. Air New Zealand welcomes the opportunity to submit on the Climate Change Commission's (the **Commission's**) 2021 draft advice for consultation.

2. Air New Zealand is supportive of a national strategy for decarbonising the New Zealand economy, accompanied by appropriate policy settings and investment, and is committed to playing its part in the global response to addressing climate change.

3. COVID-19 has had a huge impact on Air New Zealand, but it has not slowed our commitment to reducing emissions. Air New Zealand has identified decarbonisation across its network as a key strategic pillar and has the goal of achieving net-zero emissions by 2050. Air New Zealand is committed to working constructively with the Government and others in the aviation and private sector to achieve these goals.

4. Air transport is critical to New Zealand's export, investment, and tourism industries, and plays an essential role connecting our people and products to the world, and the world to us. COVID-19 has highlighted the significant economic benefit tourism provides to New Zealand and has demonstrated the criticality of local connectivity to New Zealand's primary production sector.

5. However, flying creates carbon emissions, and these are hard to abate. Even with the full deployment of aviation decarbonisation technologies, including electric, hybrid, and hydrogen aircraft, and Sustainable Aviation Fuel (**SAF**), there is no current technology mix that can enable the aviation industry to absolutely decarbonise by 2050. What's more, the industry's share of emissions will continue to increase in coming decades as other sectors decarbonise more quickly given available technologies and policy support.

6. Given aviation's limited abatement options and economic and social criticality, it is essential that the importance of aviation decarbonisation is recognised and prioritised. Additional research, policies and investment are vital to facilitate the deployment of electric, hybrid, and hydrogen aircraft, and to establish a SAF market and capabilities.

Air New Zealand is supportive of the draft advice as it relates to aviation

7. Air New Zealand is supportive of the Commission's draft advice with regards to aviation decarbonisation. We welcome the Commission's recognition of aviation as a sector that is hard-to-abate, and the recommendation to establish SAF supply at rates competitive with fossil fuels, along with policies to support supply and demand. SAF is the key aviation decarbonisation technology immediately available. For long-haul air travel, SAF is the only current option for decarbonisation.

8. Air New Zealand proposes the following amendments and additions would further strengthen the draft advice as it relates to aviation:

   - A cross-agency **public-private aviation decarbonisation governance channel** should be established in New Zealand, to identify and secure the policies and investment settings needed to support the development and commercial deployment of aviation decarbonisation, including the establishment and commercialisation of SAF. In addition, this group should be focused on moving beyond the dialogue to investment in decarbonisation technologies. This could be included in the recommendations at Necessary Action 4.

   - The Commission's central pathway model should be amended to reflect **expected emissions reductions from aviation by 2035**. These will come from the use of SAF from 2025, and from the operation of next generation aircraft by 2035.

   - The implementation of the recommendations in Necessary Action 4 should be done alongside a detailed **SAF feasibility study** to: confirm high level SAF production cost estimates; investigate feedstock options and supply; confirm the most viable pathways to SAF in Aotearoa; determine the necessary policy and investment settings; and quantify the greater benefits to Aotearoa of standing up a local SAF industry. The costs, benefits, and risks of importing SAF should also be considered in a feasibility study.

   - There is potential for more production of SAF in Aotearoa than the Commission has planned for under Necessary Action 4. We consider there are **other viable feedstock options** available in addition to woody biomass, such as municipal solid waste, sugar beet, and Power to Liquid technology. However as noted above, further work is necessary to gain a full picture of the various complexities involved in the production, location, and transport of different feedstock options, and the policies and incentives required to eliminate feedstock barriers.

   - Consideration of Aotearoa's future energy requirements must include the needs of **next generation aircraft**, including electric, hybrid, and hydrogen powered aircraft. These technologies all require access to significant amounts of clean electricity and new infrastructure. An aviation-specific energy strategy is required.

   - Related to this, a detailed feasibility study considering the development and deployment of **green hydrogen** as a low emissions technology for aviation is required, to increase understanding of the role it will play in the future, and to encourage investment.

   - In the context of a broader plan for the **bioeconomy**, policies are needed to prioritise feedstock production and sale for use in SAF over other biofuels, given it is more expensive to produce and it is the only technology available for aviation to decarbonise. Safeguards need to be applied to ensure feedstock production complies with internationally accepted sustainability criteria. New technologies and feedstock types should be researched and developed, to continue to improve decarbonisation options.

9. On **forestry**, we support the ambition to rely on native permanent forestry planted on suitable land as long-term carbon sinks for hard-to-abate sectors. As well as creating an enduring carbon sink, permanent native forestry can deliver important wider benefits for erosion, soil health, water quality and biodiversity. There are many complexities to making this a reality,

with significant investment and changes to policy settings required. If the Government took on this recommendation, we would look forward to deeper engagement on the topic.

10. More generally, Air New Zealand supports the Commission's recommendations on greater government coherence and coordination. Specifically:

    - The recommendation that the Minister for Climate Change seek **cross-party support** on emissions budgets. Bipartisan and enduring support is critical to provide certainty for the significant investment decisions and commitments that need to be made to meet decarbonisation targets.

    - The **integration of government policymaking** across climate change and other domains. This would help to provide clarity and certainty around Aotearoa's path to net zero 2050, and the significant investments that need to be made to get there.

    - The actions proposed to **align the NZETS unit volumes and price control settings with emissions budgets**. A well-signalled NZU supply pathway, and predictable, clear, and stable policy signals are essential to allow businesses time to plan and respond.

11. Further detail in response to the Commission's specific consultation questions is outlined in **Annex One**.

Where to next?

12. Air New Zealand seeks to work proactively with the Government, the SAF Consortium (Air New Zealand, Z Energy, Scion, LanzaTech and LanzaJet), industry bodies and others in the private sector to address the challenges posed by aviation carbon emissions.

13. We welcome further discussion on the content of this document and look forward to working constructively with the Government as it implements the Commission's final advice. Should you require further specific information on the above, please be in contact Meagan Schloeffel, Head of Sustainability, at Meagan.Schloeffel@airnz.co.nz.

David Morgan

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Air New Zealand

ANNEX ONE: CLIMATE CHANGE COMMISSION 2021 DRAFT ADVICE FOR CONSULTATION: QUESTIONS

Consultation question 4: Do you support budget recommendation 4? Is there anything we should change, and why?

1. Air New Zealand supports emissions budgets being met as far as possible through domestic action. Absolute reductions and investment in Aotearoa removals are preferable as far as possible.

2. However, as the Commission recognises, there is much uncertainty around meeting the emissions budgets. Air New Zealand supports greater policy space than what the Commission has proposed in Budget Recommendation 4 (b), to enable the Government to revisit the possibility of offshore mitigation should there continue to be consistent barriers to emissions reductions, or should technologies repeatedly deliver fewer emissions reductions than expected.

3. Should the option of offshore mitigation be exercised, international units used must have certified environmental integrity and not be double counted under the selling country's Nationally Determined Contribution. This is vital to protect the integrity of offsetting, and the NZETS.

Consultation question 5: Do you support enabling recommendation 1? Is there anything we should change, and why?

4. Air New Zealand supports the recommendation that the Minister for Climate Change seek cross-party support on emissions budgets. Bipartisan and enduring support is critical to provide certainty for the significant investment decisions and commitments that need to be made to meet decarbonisation targets. It is vital that policy settings are clear, stable and, as far as possible, long term, to enable the private sector to manage the costs and risks of the transition to net zero 2050.

Consultation question 6: Do you support enabling recommendation 2? Is there anything we should change, and why?

5. Air New Zealand supports the recommendation for coordination across the Government of efforts to address climate change.

Enabling Recommendation 2 (a)

6. Air New Zealand supports clear, transparent, long-term and coordinated all-of-government planning of policies and pathways to meet current and future emissions budgets. This would provide a planning horizon to guide investment and other business decisions and decrease uncertainty.

Enabling *Recommendation 2 (b)*

7. Air New Zealand supports Ministers and agencies being appointed specific policy areas to implement and manage. In addition, a cross-agency, public-private governance group focused specifically on the decarbonisation of aviation needs to be established. This idea is discussed further in response to Consultation Question 14.

Consultation questions 10 & 11

Do you support our approach to focus on decarbonising sources of long-lived gas emissions where possible? Is there anything we should change?

Do you support our approach to focus on growing new native forests to create a long-lived source of carbon removals? Is there anything we should change, and why?

8. Air New Zealand supports the ambition to drive meaningful decarbonisation instead of offsetting avoidable emissions using land resources. We support the approach of reducing gross emissions where it is feasible and leaving carbon removals to offset the hard-to-abate sectors.

9. Air New Zealand supports the role exotic forestry can play in supporting net emissions reductions to 2050, and the Commission's view that this should not be at the expense of progress to reduce gross emissions of long-lived gases in those sectors where there are already clear decarbonisation pathways.

10. Exotic forestry will also play a crucial role in feedstock for biofuels, including SAF. It is an important source for establishing SAF supply in Aotearoa, and for bringing jobs and investment to the regions.

11. Air New Zealand supports the recommendation to focus on growing new permanent native forests in suitable locations to offset the remaining long-lived gas emissions in sectors with limited opportunities to reduce emissions from 2050. This will be required to offset hard-to-abate aviation emissions. As the Commission has noted, as well as creating an enduring carbon sink, permanent native forestry can deliver important wider benefits for erosion, soil health, water quality and biodiversity.

12. There are significant costs and planning associated with establishing permanent native forests, including the costs of seedlings, pest maintenance, and necessary ongoing management and monitoring obligations. Air New Zealand supports enabling policies and investment to make native afforestation commercially viable, such as those proposed in the Aotearoa Circle's report *Native Forests: Resettling the balance*.[1]

Consultation question 12: Do you support the overall path that we have proposed to meet the first three budgets? Is there anything we should change, and why?

International Aviation

13. Air New Zealand is ready to engage this year with the Commission on its consideration of whether international aviation should be included in Aotearoa's 2050 net zero target. Key issues to be resolved include the scope of international emissions covered, jurisdiction with respect to the International Civil Aviation Organization, and target achievability both generally and alongside Air New Zealand's own net-zero 2050 target.

14. We note the Commission's assessment that its path could still allow Aotearoa to meet its 2050 target if international aviation was included. If it were included, there would be an even greater need for a viable SAF supply to be established as soon as possible to facilitate the

[1] "Native Forests: Resetting the imbalance", Aotearoa Circle, 2020.

decarbonisation of long-haul travel. We note that by 2050, there is unlikely to be a SAF/fossil fuel blend limitation in place. Should planes operate on 100% SAF, by 2050 SAF demand will likely have doubled from projections currently based on a 50% blend limitation.

15. In addition, investment in next generation aviation technologies applicable to long-haul travel, such as hydrogen, would be even more urgent.

16. If the Commission's assessment is reliant on greenhouse gas removals rather than absolute decarbonisation, it is currently unclear whether Aotearoa will have access to a sufficient volume of high-quality removal units, and how and where these removals units will be generated. Without scaling up investment in nature-based greenhouse gas removal solutions and investigating other forms of greenhouse gas removals units (such as direct air capture of CO2 with storage) a sufficient and cost-effective supply of high-quality removals units may not be available.

17. The achievability of the 2050 target as it relates to aviation will be questioned in the absence of clarity on these issues.

The path for non-road transport

Decarbonisation timeframe

18. Air New Zealand understands that, although the Commission has considered the possibility under its Tailwinds and Further Technology scenarios, it has not factored in emissions reductions from aviation under its central pathway to 2035.

19. Contrary to this, Air New Zealand does expect emissions reductions for aviation by 2035. This needs to be reflected in the Commission's central pathway to ensure prioritisation of the policies and support required to enable next generation aircraft and a viable SAF industry in Aotearoa before 2035, which is critical to the future of aviation decarbonisation. Specifically, for domestic aviation, we propose the following assumptions should be considered:
    - ~200 million litres of SAF supplied in Aotearoa by 2035[2]
    - ~30% of total domestic flights electrified by 2035

20. Establishing the right policy environment, support and infrastructure for aviation decarbonisation through SAF and next generation aircraft should be identified explicitly as a "key transition" to take place in the first budget period (alongside the electrification of rail in Table 3.1: Key transitions along our path). If SAF blending is to be possible in the second and third budgets as planned by the Commission, due to the investment and lead time required to establish SAF production it is crucial that policy settings and support are put in place now. Similarly, the infrastructure required for electric, hybrid and hydrogen aircraft to operate by 2035 requires planning for now.

Sustainable Aviation Fuels (SAF)

21. Air New Zealand supports the acknowledgement that there will be a continued need for liquid fossil fuels for some transport uses such as aviation, and recommendation that Aotearoa should take action to scale up the manufacture of low emissions fuels in the first three

[2] Analysis by the SAF Consortium- Air New Zealand, Z Energy, Scion, LanzaTech and LanzaJet.

emissions budgets periods. Further information is provided in our response to Consultation Question 14.

Next generation aircraft

22. Air New Zealand expects to realise emissions reductions on domestic routes from next generation aircraft (electric, hybrid and/or hydrogen) by 2035.

23. Air New Zealand welcomes the Commission's recognition of the role hydrogen could play in the future of energy supply for aviation. Hydrogen is key part of the technology roadmap for electric aircraft. There are different hydrogen applications for aviation being pursued, including hydrogen fuel cells to drive electric motors, and the combustion of hydrogen in modified turbine engines. With a high percentage of renewable energy, New Zealand is potentially well-placed for the deployment of green hydrogen technologies.

24. However, as with SAF, investment in the vast and complex infrastructure required for next generation aircraft is required in the years leading up to the deployment of these aircraft. This could include, for example, investment in battery charging technology, and hydrogen production and supply chains. As far as we can see, the Commission's pathway to 2035 does not recognise this.

25. Early engagement with transmission companies, energy companies, airports and others in relevant sectors is needed to identify what is required to deploy next generation aircraft, and to devise a roadmap for getting there. Given investment lead times and the complexity of the infrastructure, this process could take five to ten years.

26. Air Zealand advocates that the Commission recommend an assessment of the energy and infrastructure required for electric, hybrid and hydrogen aircraft in the first budget period, that an aviation-specific energy strategy be developed, and that a hydrogen feasibility study be carried out. Further information is provided in our response to Consultation Question 15.

The path for forestry

27. Air New Zealand supports the conclusion that forestry will be required to balance emissions from hard-to-abate sectors such as aviation out to 2050, and over the long-term. We also support the ambition to increase new permanent native forests on less productive land. Further information is provided in our response to Consultation Question 17.

28. Air New Zealand supports the finding that exotic afforestation can provide biomass feedstock for a bioeconomy. The SAF Consortium's research has shown there is a viable pathway to SAF production in Aotearoa based on forest residues, supplemented by waste and, over time, Power to Liquid technologies.[3] However, policies are needed to prioritise feedstock use for SAF production given it is more expensive to produce and is the only technology available for meaningful aviation decarbonisation. Further information is provided in our response to Consultation Question 15.

[3] Refer to para 54 for information on Power to Liquid technology.

Consultation question 14: Do you support the package of recommendations and actions for the transport sector? Is there anything we should change, and why?

29. Air New Zealand supports the recommendations in Necessary Action 4 to increase the use of liquid low carbon fuels in hard-to-abate sectors by taking actions in the first emissions budget period. SAF is the key aviation decarbonisation technology immediately available. For long-haul air travel, SAF is the only proven option for decarbonisation.

30. Air New Zealand supports the acknowledgement in Chapter 8 of the Commission's supporting evidence that low carbon liquid fuels could be biofuels, but also synthetic e-fuels such as fuels made from green hydrogen. For Air New Zealand, the term Sustainable Aviation Fuel is a catch-all for the seven technical pathways currently available, as well as Power to Liquid and future similar feedstock technologies. Countries will likely need to pursue multiple technology pathways depending on feedstock availability and proximity to infrastructure. As technology develops and different SAF pathways become viable, it is essential we remain open to considering different feedstock pathways.

Making SAF a reality in Aotearoa

31. SAF presents a proven, credible, environmental solution for air transport and will dramatically reduce emissions (up to 85%) compared to traditional jet fuel or diesel.

32. As well as enabling real abatement, investment in the development of a SAF sector would come with strong associated economic and social benefits to Aotearoa, including by creating skilled jobs benefiting regional Aotearoa in the construction and operational phases, enabling more resilient fuel supply chains (rather than relying solely on imported fuels), and utilising waste materials as feedstock, for example from forestry and landfills/municipal solid waste (with the ability to transition to other feedstock gases utilising green hydrogen in the future).

33. The SAF Consortium (Air New Zealand, Scion, Z Energy, LanzaTech and LanzaJet) has established that there is a viable pathway for standing up a SAF industry in New Zealand, and that it would have broad-reaching benefits. However, the high initial capital cost of establishing SAF production, coupled with the ongoing cost of sourcing suitable feedstocks, means that SAF commands a price premium compared to traditional fossil fuel derived jet fuel. Additional policies and investment from both the public and private sector are essential to establish a market and capabilities, and to close the commercial gap between SAF and fossil fuels. Where sustainable aviation fuel is being produced overseas, its use has been supported by public funding and other policies.

34. The Commission has recognised this in its draft advice and in its recommendations at Necessary action 4 (a), (b), and (c). Air New Zealand proposes the following amendments would further strengthen Necessary action 4 as it relates to aviation:

    (1) **Time Critical**: Air New Zealand believes Necessary action 4 should be recategorised as a Time Critical Necessary Action. Given the lead time that is required to establish SAF production in Aotearoa (~ five years), and the criticality of SAF to aviation decarbonisation, urgent action is required.

    (2) **Feasibility study:** There currently exists a knowledge gap in Aotearoa as to the most viable pathway for making SAF a commercial reality. Air New Zealand advocates for recognition that, prior to or alongside the implementation of the recommendations in Necessary action 4, a detailed feasibility study is required to:

- Confirm actual high level production cost estimates
- Confirm feedstock options and supply
- Determine the most viable pathways to SAF in Aotearoa
- Identify the necessary policy and investment settings
- Quantify the greater benefits to Aotearoa of standing up a local SAF industry

This is required as the first tangible step in setting up SAF production.

(3) **An aviation decarbonisation public-private governance body:** To recognise the criticality of the public-private cooperation and coordination required to make SAF a reality in Aotearoa, Air New Zealand proposes the Commission include a fifth recommendation under Necessary Action 4 covering the establishment of an aviation-specific governance channel.

In the UK and Norway, public-private aviation working groups have been established to develop a coordinated approach to the policy and regulatory framework needed to deliver a more sustainable aviation industry. In Norway, this includes a strong focus on the development of commercial-scale, continuous access to SAF.[4] In the UK, the focus is on delivering net zero-aviation by 2050, establishing and commercialising SAF production, and developing and industrialising zero emission aviation and aerospace technologies.[5]

A similar body established here is required to identify and secure the policies and investment settings needed to support the development and commercial deployment of aviation decarbonisation, including the establishment and commercialisation of SAF. Air New Zealand envisages this group would help to identify the requisite policies and investment settings for making SAF a reality. As in the UK, this working group should also be focused on moving beyond the dialogue to investment in decarbonisation technologies.[6]

35. Further detail and comments on Necessary action 4 are outlined below.

Necessary Action 4 (a) Set a target and introduce polices so that at least 140 million litres of low carbon liquid fuels are sold in Aotearoa by 31 December 2035.

36. Air New Zealand supports the introduction of policies to scale up production of low carbon fuels in Aotearoa in the period out to 2035 and beyond. For aviation, these policies are needed to support a SAF industry in Aotearoa.

37. Air New Zealand believes there is potential for greater SAF production quantities in Aotearoa than the Commission has planned for in its draft advice. The SAF Consortium has established there is a viable pathway to producing ~200 million litres of SAF alone in Aotearoa by 2035, and ~1,000 million litres by 2050. A key difference we can see from the Commission's assessment is that the SAF Consortium considers feedstock options in addition to woody biomass, including municipal solid waste, sugar beet,[7] and Power-to-Liquids technology.

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[4] Nordic Initiative for Sustainable Aviation (NISA)

[5] Jet Zero Council

[6] For example, through the Jet Zero Council the UK Government has pledged to invest GBP 15m in the development and commercialisation of SAF, and GBP 125m in the development and commercialisation of next generation aircraft. Further information at this link.

[7] Sugar beet is a source of sugar and surplus beets are used in ethanol production. Certification as a sustainable feedstock is critical. Sugar beet derived feedstocks are approved as sustainable feedstocks internationally, but the specific supply chain in New Zealand is in early development and not yet certified.

38. However, further analysis needs to be done before any targets and/or policies to scale up SAF production in Aotearoa can be implemented. As outlined above, an in-depth feasibility study of the possibilities of SAF production in Aotearoa needs to run alongside Necessary action 4 (a), (b), and (c), to inform policy and investment settings. Among other things, there needs to be a close examination and mapping of feedstock to determine availability and expense (by far the greatest cost in SAF production), as well as the co-benefits to Aotearoa of domestic production.

39. SAF Consortium work has determined that local production of SAF results in a lower product price through lower feedstock costs, has the potential to result in significant economic benefit for regional New Zealand (mainly through new skilled jobs), and has a (marginally) better Life Cycle Assessment[8] through reduced logistics. However, the Consortium's view is that SAF supply over time will need to include both local production and imported supply to improve supply chain security, particularly in the early years, and improve ability to manage peaks and troughs of demand over time.

40. Given this, the costs, benefits, and risks of importing SAF should also be considered in a feasibility study. It is essential that any SAF targets and policy settings enable a dual-supply model and do not differentiate between local production and imported SAF.

41. An aviation-specific public-private governance channel as suggested above could assist to action the feasibility study findings as appropriate.

Necessary Action (4) (b) Introduce low carbon fuel standards or mandates to increase demand for low carbon fuels, with specific consideration given to aviation.

42. Air New Zealand supports introducing policies to increase the demand for low carbon fuels in Aotearoa, with specific consideration given to aviation. These types of policies are critical to encouraging much-needed investment in SAF.

43. Overseas, the main vehicle being used by governments to increase and ensure long-term demand is a SAF specific supply-side mandate. Initially these are being set at 0.5% and 2%,[9] ratcheting up over the next 30 years to the current approved maximum SAF blend rate of 50%,[10] or in the case of the EU, 63%.[11] A mandate that starts low and ratchets up over time is essential to allow for production and supply chains to be stood up, and to provide a manageable transition period for producers, suppliers, and distributors.

44. Air New Zealand is supportive of the work the Government is currently doing to consider a biofuels mandate for Aotearoa and will be advocating for a SAF-specific mandate.

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[8] A Life Cycle Assessment is a calculation of the life cycle emissions value of a specific type of SAF. The amount of emissions reductions generated by SAF depends on its life cycle emissions value.

[9] In Norway, from 1 Jan 2020 a 0.5% blend mandate is in effect, planning for a 30% target in 2030. In Sweden, a 0.8% mandate will be in place in 2021, increasing to 30% in 2030. Spain and the EU are planning a 2% SAF supply mandate in 2025.

[10] A fuel blend of 50% SAF and 50% fossil fuel. We anticipate that flying with 100% SAF will be approved before 2050. Boeing recently announced that it is working on producing aircraft capable of flying on 100% SAF by 2030.

[11] The EU is proposing to start with a 2% mandate in 2025, moving to a 20% mandate in 2035 and 63% in 2050.

45. In the context of Aotearoa, the SAF Consortium roadmap considers a 2.5% mandate in 2025, increasing to 50% in 2050. This ambition is consistent with the ambitions of other leading countries, like France.[12] Others, like Finland and Sweden, are bringing forward the scaleup, with intended 30% mandates by 2030.

46. The Consortium's roadmap envisages that a SAF uptake mandate would initially focus on local production capability, with incremental increases in a mandate being managed through a mix of increasing local production and SAF importation. On this basis, the primary factor underpinning the setting of an initial mandate is the market created by supply of the volume of SAF able to be produced economically by an initial plant. The SAF Consortium has determined that minimum viable production would be ~40 million litres per annum (mlpa) (33mlpa SAF and 7mlpa renewable diesel). On this analysis, a mandate must create a market that obliges consumption of this volume of SAF per annum.

47. It would not be commercially viable in New Zealand for a SAF mandate to differentiate between fuel-uptake for domestic and international travel. This is because domestic fuel uptake demand alone would not be enough to support production economies of scale and the significant cost of investing in SAF. Differentiating between domestic and international travel could also lead to competitive distortions.

48. Finally, it is critical to note that a mandate alone would not make SAF production and consumption commercially viable in New Zealand. Additional policies and investment are essential to drive biofuel production towards SAF (rather than cheaper to produce ground transport fuels), to establish a SAF market and capabilities, and to close the commercial gap between SAF and fossil fuels. This is recognised by the Commission in its recommendation at (c), discussed below.

Necessary Action 4 (c) Introduce incentives to establish low emissions fuel plants, such as biofuel sustainable aviation fuel, and make those fuels more competitive with traditional fossil fuels

49. Air New Zealand supports incentivising SAF production and making SAF more competitive with traditional fossil fuels. The high initial capital cost of establishing SAF production, coupled with the ongoing cost of sourcing suitable feedstocks, means that SAF commands a price premium compared to traditional fossil fuel derived jet fuel.[13] Additional policies and investment are essential to establish a market and capabilities, and to close the commercial gap between SAF and fossil fuels. This includes policy settings to drive feedstock supply and biofuel production towards SAF rather than cheaper-to-produce ground transport fuels.[14]

50. Governments around the world are grappling with the best way to support the development of SAF industries. At this point, no specific policy or support is recommended or favoured over another. It is likely a portfolio approach would apply. Policies could include:
    - A SAF production incentive per litre

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[12] France will have a SAF blending mandate in force from Jan 2022, starting at 1% and working towards 2% in 2025, 5% in 2030 and 50% in 2050.

[13] Currently, Air New Zealand estimates the cost of SAF would be significantly more expensive than fossil fuel (imported SAF being at the higher range of our cost estimates). There would be a 1.3 to 2 times price premium for blended SAF rates compared to straight fossil fuel.

[14] The European and Californian experiences have confirmed that without policy incentives for SAF production, most biofuel supply will be produced for road transport- a sector with various decarbonisation solutions already available. In response, the EU has developed SAF-specific policies to ensure feedstock is biased to SAF production (see EU Renewable Energy Directive II recast to 2030).

- Capital grants to help establish SAF production capacity and supply chain infrastructure
- NZETS exceptions for SAF use
- Ring-fenced funds for use for CAPEX relating to establishing SAF production, and/or financial incentives for feedstocks sold for mandated SAF production (for example from the NZETS, international visitor levy or a similar funding mechanism)

51. This is something that a feasibility study would help to clarify, and that an aviation-specific governance channel could assist to develop.

Consultation question 15: Do you support the package of recommendations and actions for the heat, industry and power sectors? Is there anything we should change, and why?

Time-critical necessary action 3

52. Air New Zealand supports the development of a long-term national energy strategy that provides clear objectives and a predictable pathway away from fossil fuels and towards low emissions fuels, and the infrastructure to support delivery.

53. Given the unique requirements of next generation aircraft and SAF, an aviation-specific energy strategy needs to be developed under this, and include roadmaps for SAF, electrification, and hydrogen technologies. This would be particularly beneficial for encouraging the investment needed to make these technologies a reality.

Necessary Action 5

54. Under Necessary Action 5 (d), Air New Zealand advocates that any assessment of whether electricity distributors are equipped, resourced, and incentivised to innovate and support the adoption on their networks of new technologies, platforms, and business models should consider:
    - **Electricity demand and related infrastructure needs of next generation aircraft**. We estimate that electric, hybrid and/or hydrogen powered aircraft will enable emissions reductions on domestic short to mid-range flights by 2035. However, new infrastructure and policies are required to make these new technologies a reality. Examples include additional renewable generation in locations where hydrogen might be produced, airport substations enabling high voltage charging, fueling technology standards (both charging and hydrogen) to enable industry acceptance and implementation, and energy distribution hubs and networks.

    - **Electricity demand of Power to Liquid (PtL) SAF**. PtL SAF is produced using renewable electricity, water, and carbon dioxide, and can be provided via any existing bioderived SAF infrastructure. Switching from conventional jet fuel to PtL SAF has the potential to reduce lifecycle emissions by 70% or more. The main technologies involved are already developed, and the decarbonisation potential and Aotearoa's high percentage of renewable electricity means it would make sense to deploy here. However, producing significant volumes of PtL SAF would require considerable amounts of renewable energy.

Necessary Action 6 (a)

55. Air New Zealand supports the development of a cross-sectorial plan for the bioeconomy, including bioenergy, alongside the national energy strategy.

56. For bioenergy, Air New Zealand agrees there is a clear role for Government in providing direction and coordination through the development of a long-term plan. This would help to attract investment in production and supply chain infrastructure, and to build supply of biofuels.

Air New Zealand supports the Commission's suggestion that "well-targeted research and development incentives, enabling infrastructure through capital and finance offerings, and choices which reduce or share the risk of enterprises, are valuable leavers available to the Government to help develop an industry ecosystem".[15]

57. As the Commission notes, it may be appropriate to focus the use of bioenergy on opportunities which offer considerable emissions reductions and which cannot be easily or cheaply achieved by competing technologies.[16] Access to low carbon fuel is particularly critical for aviation, for which there are limited other viable pathways to decarbonisation. In addition, substituting conventional jet fuel with SAF can give up to an 85% reduction in CO2 emissions over the lifecycle of the fuel, which makes the use of SAF a powerful tool for decarbonising aviation. Given this, and the importance of aviation to the economy, it is critical that feedstock is prioritised for SAF. A cross-sectorial plan for the bioeconomy could confirm this and assist with identifying appropriate policies to direct feedstock to aviation.

58. A plan for the bioeconomy should include the research and development of new technologies and feedstocks to continuously improve decarbonisation options.

59. Air New Zealand notes the emerging risk to feedstock supply in Aotearoa from the Roundtable for Sustainable Biomaterials (RSB), which is proposing to put strict limits on the use of woody biomass from post-harvest residues. Air New Zealand and Scion are closely engaged on this issue, and welcome further engagement with the Government. Notwithstanding this, Air New Zealand fully supports independent third-party certification of feedstock supply chain sustainability and sees this certification as an important component in underpinning the success of a SAF industry.

60. Furthermore, Air New Zealand supports the application of strict environmental standards to biofuel feedstocks. Safeguards need to be applied to ensure feedstock production complies with internationally accepted sustainability criteria. For example, attention should be paid to direct and indirect land use change, water use, and biodiversity.

Necessary Action 6 (b)

61. Air New Zealand supports the recommendation to assess the role of hydrogen in the new national energy strategy. Hydrogen is key part of the technology roadmap for electric aircraft. On our analysis, hydrogen fuel cell aircraft have the potential to address domestic emissions by 2045. Before then, PtL SAF has the potential to reduce lifecycle emissions by 70% or more compared to traditional jet fuel. In the longer term, hydrogen fuel cell technology has the potential to offer emissions reductions for long-haul travel.

62. However, the hydrogen pathway requires further technological development, and a local supply of clean hydrogen. We support the Commission's suggestion in Chapter 17 of its draft supporting evidence that the Government undertake exploratory research into the development and deployment of hydrogen as a low emissions technology for aviation, to increase understanding of the role it will play in the future.[17]

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[15] Climate Change Commission (2021), Chapter 17: The direction of policy for Aotearoa, page 35.
[16] Climate Change Commission (2021), Chapter 8: What our future could look like, page 58.
[17] Climate Change Commission (2021), Chapter 17: The direction of policy for Aotearoa, page 35.

63. A detailed feasibility study considering hydrogen for aviation is required to increase understanding of the role it will play in the future, and to encourage investment. In addition, as outlined above, an aviation-specific energy strategy needs to be developed and include a roadmap for hydrogen powered aircraft in Aotearoa.

64. Air New Zealand supports the point made by both Auckland Airport and Hiringa Energy in their submissions, on the need for the Commission and Government to consider the retention and use of our current gas infrastructure for future energy transport and supply. For example, pipelines for transporting hydrogen for powering aircraft.

Consultation question 17: Do you support the package of recommendations and actions for the forestry sector? Is there anything we should change, and why?

65. Air New Zealand is committed to the decarbonisation of our operations through absolute carbon abatement. However, there is currently no viable technology mix that would enable this. The reality is that offsetting will continue to be required for a portion of our emissions out to 2050 and beyond.

66. Air New Zealand is supportive of the Commission's conclusion that forestry will be required to meet the first three emissions budgets, and to balance emissions from hard-to-abate sectors such as aviation over the longer term.

67. Air New Zealand also supports increasing the amount of permanent native forests on suitable land to provide a long-term carbon sink. Permanent native forestry can provide multiple benefits in addition to carbon offsetting, including improvements to water quality, soil erosion, and biodiversity; optimisation of marginal land; and new income streams, particularly for regional communities.

68. We have supported various permanent forestry sink initiative projects that feature permanent native forestry in the past and are now experiencing challenges accessing required volumes of permanent native forestry credits. We consider that more flexible and enabling policies either within or alongside the NZETS that recognise and value co-benefits will significantly improve the scale of domestic carbon emissions abatement and environmental benefits that can be realised from native afforestation.

69. As the Commission has recognised in its draft advice and in Chapter 17 of its supporting evidence, establishing new native permanent forests has limitations and comes at a significant cost.[18] Increased government support and new policy settings are needed. This includes policies to support nursery capacity, pest control and fencing, and the issue of forest management over the long term, such as proposed by the Commission in Chapter 17.[19]

70. Air New Zealand supports the conclusions in the Aotearoa Circle's report *Native Forests: Resettling the balance*.[20] This includes the Report's recommendations to incentivise the planting of native forestry, which fall into the following three broad categories:
    (1) Financial incentives and subsidies which seek to reduce the financial gap between pine and native planting

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[18] Climate Change Commission (2021), Chapter 17: The direction of policy for Aotearoa, pages 51-53.
[19] Climate Change Commission (2021), Chapter 17: The direction of policy for Aotearoa, pages 52-53.
[20] "Native Forests: Resetting the imbalance", Aotearoa Circle, 2020.

(2) NZETS changes that could broaden the scope of eligible land to include land types more suited to natives
(3) Reducing barriers and kick-starting the market through increasing the commercial viability and feasibility of native planting at scale

71. In the context of the NZETS, the Commission's proposed move away from production forests in the transition to low emissions will need to be managed carefully. There are many complexities to making this a reality, with significant investment and changes to policy settings required. If the Government took on this recommendation, we would look forward to deeper engagement on the topic.

Consultation question 19: Do you support the package of recommendations and actions to create a multisector strategy? Is there anything we should change, and why?

Necessary Action 15

72. Air New Zealand supports the integration of government policymaking across climate change and other domains. This would help to provide clarity and certainty around Aotearoa's path to net zero 2050, and the significant investments that need to be made to get there.

Necessary Action 17

73. Air New Zealand supports the Government implementing its proposed mandatory financial disclosure regime. Air New Zealand is a signatory to the Task Force on Climate-related Financial Disclosure (TCFD) and is focused on understanding and mitigating climate risk.

74. Further Government investment is required to develop standardised tools and models for disclosing entities, to ensure consistency in the measurement of climate-related risks and opportunities and facilitate greater consistency in disclosure.

Time-critical necessary action 6

75. Air New Zealand agrees that target-consistent long term abatement cost values should be factored into policy and investment analysis by central government. Local government and the private sector should also be encouraged to do so. This is essential to understanding what will be required to keep the cost of abatement manageable for a smooth and equitable transition.

Time-critical necessary action 7

76. Air New Zealand supports aligning the NZETS unit volumes and price control settings with emissions budgets. A well-signalled NZU supply pathway, and predictable, clear, and stable policy signals are essential to allow business time to plan and respond.

Necessary Action 19

77. Air New Zealand supports the following recommendations:

- **Necessary Action 19 (a)**: We would support for example the ring-fencing of NZETS funds for the acceleration of low emissions technology research, investment, and development- both for specific low carbon technologies, as well to enable tax incentive structures. Given the large capital outlay necessary to advance aviation decarbonisation technology and the lack of other emissions abatement options for the air transport sector, we would advocate for NZETS funding ring-fence specifically for SAF, next generation aircraft infrastructure, and new battery technology.
- **Necessary Action 19 (e)**: We agree that clarity is required on how the Government intends to manage NZETS unit volumes under its split-gas target and with agricultural emissions outside of the NZETS.
- **Necessary Action 19 (f)**: Clarification of the role and avenues for voluntary mitigation in Aotearoa is necessary. Air New Zealand is engaged in the Government consultation process on this issue.

Consultation question 20: Do you agree with Budget recommendation 5? Is there anything we should change, any why?

78. Air New Zealand supports the Ministry for the Environment's current investigation into potential pathways for credible voluntary carbon offsetting, using New Zealand-generated mitigation, in the context of the Paris Agreement period of 2021–2030.